

## APPENDIX

5. A high-pressure pipe assembly, comprising:

a metal pipe having opposite first and second ends, a connecting head adjacent said first end, said connecting head having a seat surface flared outwardly from said first end, a cylindrical surface extending from said seat surface away from said first end and a bearing surface extending inwardly from an end of the cylindrical surface remote from the seat surface, said cylindrical surface having a selected outside diameter, a cylindrical body extending from said bearing surface of said connecting head toward said second end, said cylindrical body having an outside diameter less than said selected outside diameter of said cylindrical surface of said connecting head, a passage extending centrally through said metal pipe from said first end to said second end, portions of said passage within said connecting head defining an annular groove spaced from said first end, and

a unitarily formed sleeve washer having opposite first and second ends, a first portion of said sleeve washer extending from said first end toward said second end thereof having a first cylindrical inner surface surrounding and closely engaging at least a portion of said cylindrical surface of said connecting head, a second portion of said sleeve washer extending from said second end thereof toward the first end having a second cylindrical inner surface surrounding and closely engaging portions of said cylindrical body adjacent said connecting head and an inner bearing surface extending between said first and second cylindrical inner surfaces and closely engaging the bearing surface of said connecting head, said sleeve washer further having a cylindrical outer surface facing oppositely from said first and second cylindrical inner surfaces and extending substantially from said first end of said sleeve washer to a location aligned with said second cylindrical inner surface of said sleeve

washer, first said portion of said sleeve washer defining a first radial thickness and said second portion of said sleeve washer defining a second radial thickness, said second radial thickness being greater than said first radial thickness, and an annular outer bearing surface extending substantially orthogonally to said second cylindrical inner surface and facing second end of said sleeve washer.

6. The high-pressure pipe assembly of claim 5, wherein said seat surface comprises a conically generated surface.

7. The high-pressure pipe assembly of claim 5, wherein said seat surface comprises a spherically generated surface.

8. The high-pressure pipe assembly of claim 5, wherein said seat surface comprises a planar end face at said first end of said pipe and a flared surface extending outwardly from said planar end surface.

9. The high-pressure pipe assembly of claim 5, wherein the connecting head includes a radially aligned annular surface extending between said connecting head and said cylindrical body.

10. The high-pressure pipe assembly of claim 5, wherein the connecting head includes a conically generated surface extending between said connecting head and said cylindrical body.

11. The high-pressure pipe assembly of claim 5, wherein said passage has a first cylindrical portion between said annular groove and said first end and a second cylindrical portion extending from said annular groove toward said second end, said first and second cylindrical portions defining an inside diameter less than diameters of said passage at said annular groove, said annular groove comprising a smoothly concave toroidal surface at

locations between said first and second cylindrical portions, and first and second inwardly convex toroidal surfaces smoothly extending respectively from said first and second cylindrical portions into said concave toroidal surface.

12. The high-pressure pipe assembly of claim 5, wherein said outside diameter of said cylindrical surface of said connecting head is between 10%-45% larger than said outside diameter of said cylindrical body.

13. The high-pressure pipe assembly of claim 12, wherein said outside diameter of said cylindrical surface of said connecting head is between 12.5%-30% larger than said outside diameter of said cylindrical body.

14. The high-pressure pipe assembly of claim 13, wherein said outside diameter of said cylindrical surface of said connecting head is between 15%-20% larger than said outside diameter of said cylindrical body.